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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,280	08/05/2003	Neal B. Lesh	MERL-1481	7122

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EXAMINER
LEWIS, ALICIA M

ART UNIT	PAPER NUMBER
2164	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/634,280	LESH ET AL.
	Examiner	Art Unit	
	Alicia M. Lewis	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 December 2006</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-13* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

This office action is responsive to the Request for Continued Examination (RCE)

filed December 8, 2006. Claims 1, 8, 10, 12 and 13 are currently amended, and claim 9

has been cancelled. Therefore claims 1-8 and 10-13 are pending in this application.

Claim Objections

1.　·Claims 10, 12 and 13 are objected to because of the following informalities: the

status identifiers are incorrect. All three claims are currently amended and the status

identifiers should reflect that. Appropriate correction is·required.

Claim Rejections - 35 USC § 101

2.　35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claims 1-7 and 10-13 are rejected under 35 U.S.C. 101 because the claimed

invention is directed to non-statutory subject matter. Claims 1-7 and 10-13 are directed

to a method for improving a solution to a combinatorial optimization problem. This

claimed subject matter lacks a practical application of a judicial exception (law of nature,

abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful,

concrete and tangible result.

Specifically, the claimed subject matter does not produce a tangible result

because the claimed subject matter fails to produce a result that is limited to having real

world value rather than a result that may be interpreted to be abstract in nature as, for

example, a thought, a computation, or manipulated data. More specifically, the claimed

subject matter provides for an improved solution of a combinatorial optimization

problem. This produced result remains in the abstract and, thus, fails to achieve the

required status of having real world value.

Examiner suggests storing the improved solution in a memory.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1.   Claims 1, 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Applicants' Admitted Prior Art (AAPA) in view of Hara et al. (US Patent 5,568,381)

('Hara').

With respect to claims 1 and 8, AAPA teaches:

applying a priority algorithm in a form of an ordering function to an instance of the

combinatorial optimization problem to produce an initial solution including an ordering of

the elements (elements 110 and 103 in Figure 1);

applying a placement function to map values to the corresponding elements of

the ordering (element 120 in Figure 1).

AAPA does not teach modifying the ordering of the elements to produce a re-ordering of the elements; and repeating the modifying and the applying until all elements have been placed to obtain an improved solution of the combinatorial optimization problem.

Hara teaches a combinatorial optimization system that extracts an undesirable relationship from a present solution (see abstract) in which he teaches:

modifying the ordering of the elements to produce a re-ordering of the elements (Figures 1A-B, 9A-B and 10A-B, column 2 line 57 – column 3 line 5, column 7 lines 1-45); and

repeating the modifying and the applying until all elements have been placed to obtain an improved solution of the combinatorial optimization problem (Figures 9A-B, 10A-B, column 3 lines 4-5, 53-58, column 5 lines 24-28).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified AAPA by the teaching of Hara because modifying the ordering of the elements to produce a re-ordering of the elements; and repeating the modifying and the applying until all elements have been placed to obtain an improved solution of the combinatorial optimization problem would enable a shortened amount of time required for improvements in solving NP hard combinatorial optimization problems by reducing the number of neighborhoods. It would also enable the ability to obtain a global optimum solution without resulting in a local optimum solution (Hara, column 3 lines 20-23).

With respect to claim 3, AAPA as modified teaches in which the priority algorithm is dynamic (AAPA, paragraph 8 lines 6-7).

2.   Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Hara et al. (US Patent 5,568,381) ('Hara') as applied to claims 1, 3 and 8 above, and further in view of Angelopoulos et al., "On the Power of Priority Algorithms for Facility Location and Set Cover," APPROX, pp 26-39, 2002 ('Angelopoulos').

With respect to claim 2, AAPA as modified teaches claim 1.

AAPA as modified does not teach in which the priority algorithm is fixed.

Angelopoulos teaches priority algorithms (see abstract) in which he teaches in which the priority algorithm is fixed (page 27 lines 9-11).

It would have been obvious to a person having ordinary skill in the art to have further modified AAPA by the teaching of Angelopoulos because a priority algorithm that is fixed would enable a predetermined ordering of values, which would not change throughout execution of the algorithm (Angelopoulos, page 27 lines 9-11).

3.   Claims 4, 5, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Hara et al. (US Patent 5,568,381) ('Hara') as applied to claims 1, 3 and 8 above, and further in view of Krishnan et al. (US Patent Application Publication 2003/0051165 A1) ('Krishnan').

With respect to claims 4 and 10, AAPA as modified teaches claims 1 and 3.

AAPA as modified does not teach in which the re-ordering is within a predetermined distance of the ordering.

Krishnan teaches adaptive re-ordering of data packet filter rules (see abstract), in which he teaches in which the re-ordering is within a predetermined distance of the ordering (paragraphs 33-34).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have further modified AAPA by the teaching of Krishnan because in which the re-ordering is within a predetermined distance of the ordering would enable a better-performing, rule-based operation (Krishnan, paragraph 8 lines 12-14).

With respect to claims 5 and 11, AAPA as further modified teaches in which the distance is a Kendall-tau distance (Krishnan, paragraph 34).

4.   Claims 6 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Hara et al. (US Patent 5,568,381) ('Hara') as applied to claims 1, 3 and 8 above, and further in view of Beygelzimer et al. (US Patent Application Publication 2002/0161736 A1) ('Beygelzimer').

With respect to claims 6 and 12, AAPA as modified teaches claims 1 and 3.

AAPA as modified does not teach in which the re-ordering uses a decision vector, and in which the decision vector has one field for each element of the order, each field determining a new order of the element in the re-ordering.

Beygelzimer teaches systems and methods for using continuous optimization for ordering categorical data sets (see abstract), in which he teaches in which the re-ordering uses a decision vector, and in which the decision vector has one field for each element of the order, each field determining a new order of the element in the re-ordering (Beygelzimer, paragraph 53).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have further modified AAPA by the teaching of Beygelzimer because the re-ordering uses a decision vector, and in which the decision vector has one field for each element of the order, each field determining a new order of the element in the re-ordering would enable the formulation of the ordering problem in a fundamentally different way, which would avoid intractable combinatorial formulations (Beygelzimer, paragraph 29).

5.   Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Hara et al. (US Patent 5,568,381) ('Hara') as applied to claims 1, 3 and 8 above, and further in view of Lesh et al. (US Patent Application Publication 2004/0167661 A1) ('Lesh').

With respect to claims 7 and 13, AAPA as modified teaches claims 1 and 3.

AAPA as modified does not teach in which the re-ordering is probabilistic.

Lesh teaches a method for packing rectangular strips (see abstract) in which he

teaches in which the re-ordering is probabilistic (paragraph 72).

It would have been obvious to a person having ordinary skill in the art at the time

the invention was made to have further modified AAPA by the teaching of Krishnan

because in which the re-ordering is probabilistic would enable the selection of decision

vectors at each step randomly according to a probability distribution (AAPA, paragraph

43).

Response to Arguments

6.   Applicant's arguments with respect to claims 1 and 8 have been considered but

are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Alicia M. Lewis whose telephone number is 571-272-

5599. The examiner can normally be reached on Monday - Friday, 9 - 6:30, alternate

Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Charles Rones can be reached on 571-272-4085. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alicia Lewis
February 28, 2007

SAM RIMELL
PRIMARY EXAMINER